

WHAT IS CLAIMED IS:

1. A method of treating a plastic article comprising:
 - (a) providing a plastic article comprising at least one polymer selected from thermoplastic polymer and thermoset polymer;
 - 5 (b) contacting at least a portion of the surface of said plastic article with a treatment composition comprising,
 - (i) at least one additive selected from UV stabilizers, optical brighteners, mold release agents, antistatic agents, thermal stabilizers, IR absorbers and antimicrobial agents,
 - 10 (ii) water,
 - (iii) at least one carrier represented by the following general formula I,

I

$$R^1 - \left[O - (CH_2)_n - \right]_m O - R^2$$

15 wherein R^1 is a radical selected from the group consisting of linear or branched C_1-C_{18} alkyl, benzyl, benzoyl and phenyl,
 R^2 is a radical selected from the group consisting of linear or branched C_1-C_{18} alkyl, benzyl, benzoyl, phenyl and H,
 n is 2, 3 or 4, and
 m is 1 to 35, and

- (iv) a diol selected from at least one of linear or branched C_2-C_{20} aliphatic diols, poly(C_2-C_4 alkylene glycol), cycloaliphatic diols having from 5 to 8 carbon atoms in the cyclic ring, monocyclic aromatic diols, bisphenols and hydrogenated bisphenols;

- (c) maintaining said portion of said plastic article in contact with said treatment composition for a period of time at least sufficient to form a treated plastic article; and
- (d) removing said treated plastic article from contact with said treatment composition.

5 2. The method of Claim 1 wherein said treatment composition is maintained at a temperature of 25 to 99°C

10 3. The method of Claim 1 wherein said plastic article is contacted with said treatment composition by at least one of:

- (I) dipping at least a portion of the surface of said plastic article into said treatment composition; and
- (II) applying said treatment composition to at least a portion of 15 the surface of said plastic article.

4. The method of Claim 3 wherein said treatment composition is applied to at least a portion of the surface of said plastic article by at least one of spray application, curtain application and spin application.

20 5. The method of Claim 1 wherein said plastic article comprises a polymer selected from at least one of (co)polyesters, (co)polycarbonates, polyesterpolycarbonate copolymers, acrylonitrile-butadiene-styrene copolymers, polyamides, polyurethanes, 25 polyalkyl(meth)acrylate and styrene copolymers.

6. The method of Claim 1 wherein R¹ is selected from linear or branched C₁-C₁₈ alkyl, R² is selected from linear or branched C₁-C₁₈ alkyl and H, and n is 2.

7. The method of Claim 6 wherein R¹ is selected from n-butyl, i-butyl and t-butyl, and R² is selected from n-butyl, i-butyl, t-butyl and H.

8. The method of Claim 1 wherein said treatment composition
5 further comprises a surfactant that is different than said carrier, said surfactant being selected from at least one of: anionic surfactants; amphoteric surfactants; and a non-ionic surfactant selected from at least one poly(C₂-C₄ alkoxylated) C₁₄-C₁₈ unsaturated fatty acid.

10 9. The method of Claim 8 wherein said surfactant is present in an amount of from 1 to 15 percent by weight, based on the total weight of said treatment composition.

10. The method of Claim 1 wherein said diol is a poly(C₂-C₄
15 alkylene glycol) selected from diethylene glycol, triethylene glycol, tetraethylene glycol, pentaethylene glycol and mixtures thereof.

11. The method of Claim 10 wherein said diol is diethylene
glycol.

20 12. The method of Claim 10 wherein R¹ is selected from linear or branched C₁-C₁₈ alkyl, R² is H, n is 2 and m is 1.

13. The method of Claim 12 wherein R¹ is selected from n-butyl,
25 i-butyl and t-butyl.

14. The method of Claim 1 wherein said plastic article comprises at least one of static dyes, photochromic dyes, pigments, crosslinked polymethylmethacrylate microspheres, glass microspheres and metal
30 flakes.

15. The method of Claim 1 wherein said plastic article comprises a thermoplastic polycarbonate selected from at least one of thermoplastic aromatic polycarbonates and thermoplastic aliphatic polycarbonates.

5 16. The method of Claim 1 wherein said plastic article is a molded article comprising a thermoset polycarbonate.

10 17. The method of Claim 16 wherein said thermoset polycarbonate is a polymerize of a polymerizable composition comprising polyol(ally carbonate) monomers.

18. The method of Claim 1 wherein said plastic article is a molded article selected from shaped articles, films and sheets.

15 19. The method of Claim 18 wherein said molded article is a shaped article selected from optical lenses, ophthalmic lenses, sunshade lenses and glazings.

20 20. The method of Claim 1 wherein said plastic article is selected from thermoplastic pellets and thermoplastic strands.

25 21. The method of Claim 20 further comprising, melting at least one of said treated thermoplastic pellets and said treated thermoplastic strands to form a treated molten thermoplastic composition, and introducing said treated molten thermoplastic composition into a mold, thereby forming a treated shaped molded article.

22. The method of Claim 1 further comprising contacting said treated plastic article with a dye composition comprising at least one dye, thereby forming a treated and dyed plastic article.

5 23. The method of Claim 1 wherein the plastic article of step (a) is a dyed plastic article, which is formed by contacting said plastic article with a dye composition comprising at least one dye, further wherein said treated plastic article of step (c) is a treated and dyed plastic article.

10 24. The method of Claim 1 further comprising:

- (i) contacting said treatment composition with particulate activated carbon to form a mixture of said treatment composition and particulate activated carbon;
- (ii) isolating from said mixture a substantially additive-free liquid comprising water, said carrier and said diol; and
- (iii) optionally adding at least one additive to said substantially additive-free liquid, thereby forming a further treatment composition.

20 25. The method of Claim 1 further comprising:

forming said treatment composition by,

- (i) preparing a mixture of water, said carrier and said diol,
- (ii) introducing said additive into a filter, and
- (iii) passing said mixture over said additive and through said filter, thereby forming said treatment composition; and

25 passing continuously said treatment composition through said filter.

26. The method of Claim 1 further comprising,
introducing continuously said treatment composition into an immersion
30 tank through a plate having a plurality of perforations.

27. The method of Claim 1 wherein said treatment composition further comprises at least one dye selected from static dyes and photochromic dyes.

5 28. The method of Claim 1 further comprising contacting at least a portion of the surface of the treated plastic article removed from contact with said treatment composition with a rinse composition comprising water, and optionally at least one of said carrier (iii) and said diol (iv).